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# THE BRACHIOPODS OF SOUTH AUSTRALIA.

By Jos. C. VERCO, M.D. (Lond.), F.R.C.S. (Eng.), etc.

[Read April 5, 1910.]

PLATES XXVII. AND XXVIII.

In November, 1906, Professor F. Blochmann, of the Zoological Institute of the University of Tubingen, wrote to Professor Stirling, Director of the Adelaide Museum, requesting the loan of its Brachiopod material, so as to permit of his investigating the South Australian forms. He was working up the Brachiopods of the Valdivia and Gauss Expedition, and had been led into some important questions concerning the geographical distribution of the members of this group. As the Museum material was meagre, Professor Stirling passed the letter on to me, and I sent Professor Blochmann all our well-known forms, and as many other species as I had then separated, from the shells dredged during several years.

In the early part of this year he forwarded a communication to be used at my discretion, either as a paper by Professor Blochmann, presented by me, to be published in the Transactions of the Royal Society of South Australia, or as material for me to use in compiling a paper of my own. To combine the two ideas seemed the proper course, and with the acquiescence of the Council I present a paper on the Brachiopods of South Australia, which will deal with all the species hitherto found in our waters, and will incorporate Professor Blochmann's descriptions of his three new species, translated from his manuscript, and attributed, as they should be, to him as their author. We are indebted to him for the photographs of his three species. My remaining material has supplied two other new species, which I have described and figured.

The late Professor Tate, in a Revision of the Recent Lamellibranch and Palliobranch Mollusca of South Australia, Trans. Roy. Soc. of S. Austr., vol. ix., 1886, p. 76 to p. 111, enumerated five Brachiopods, namely, *Waldheimia flavescens*, Lamarck, now called *Magellania flavescens*; *Terebratella cancellata*, Koch, now *Terebratulina cancellata*; *Megerlia willemœsi*, Davidson, which was a misidentification, and is the *Magasella vercoi*, Blochmann, n. sp.; *Kraussina lamarckiana*, Davidson, which remains unaltered; and

*Orbicula tenuis*, Sowerby, reported from Chili and Port Lincoln: this latter locality is certainly erroneous, no collector having taken it, so it is erased from our list.

In vol. xi., *op. cit.*, 1888, p. 69, Professor Tate added *Magasella cumingi*, Davidson; and in vol. xiv., 1891, p. 269, *Terebratula wyvillei*, Davidson, dredged by the "Challenger" in lat. 42° 22′, which is a considerable distance off our shores. This is now named *Liothyris wyvillei*.

To the five species, belonging to five different genera above recorded by Professor Tate, we are able to add in this paper two previously-described species, *viz.*, *Kraussina atkinsoni*, Tenison-Woods, and *Cryptopora brazieri*, Crane; and five species hitherto undescribed, *viz.*, *Magasella vercoi* and *M. jaffaensis* and *Cistella australis*, all of Blochmann; and *Magasella radiata* and *Terebratulina cavata*, both of Verco, bringing our number up to twelve species belonging to seven genera.

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## New Brachiopods from South Australia.

By F. Blochmann, Tubingen.

Dr. Verco, of Adelaide, had the kindness to place in my hands a large number of Brachiopods for classification which he had collected off the coast of South Australia. For this I tender him my best thanks. The material embraced, besides well-known species from these waters, such as *Magellania flavescens*, *Magasella cumingi* and *Kraussina lamarckiana*, two *Magasellas* and one *Cistella*. About the first two, Dr. Verco properly presumed that they were forms hitherto unknown; the last he believed was *Cistella cuneata*, which from want of material for comparison is easily explicable. This species is also new. I give below an accurate description of the three species, and remark as follows:—Some authors question whether Brachiopods of the type of *Magasella* are independent forms, and are only immature stages of *Terebratella*—even though becoming sexually mature—but I hold this view is not correct in all cases. Among the examples of *Magasella vercoi* described hereafter, and also among the examples of *M. cumingi* sent to me by Dr. Verco are found, in considerable number, those which present all the marks of quite full-grown animals, especially a striking thickening of the shells in part, with loss of much of the more delicate sculpture; so that any further development of these forms is with certainty excluded. The genus *Magasella* is to be retained. I will return to this in fuller detail in another place.

**Magasella vercoi,** n. sp., Blochmann. Pl. xxvii., figs. 1 to 5.

Shell small, in outline of a slender pear shape, higher than wide, remarkably thickwalled, light to dark dull coral-red, with a conspicuous finger-shaped hinge process. The greatest width is somewhat in front of the centre. Beak stout, rather strongly bent dorsalwards, and then obliquely truncate, with a moderately large hole. Its sides are rounded, and towards the deltidial plate are finished off in a sharp edge. Deltidial plates large, joining together widely. Lateral edge of the ventral valve in the neighbourhood of the teeth raised dorsally in a low point, further forwards curving ventrally. Front edge distinctly convex dorsally.

Both valves are nearly equally deep. The accremental striæ are in both quite distinct. To the square millimetre there are about 216 pores, the inner diameter of which amounts to 20 $\mu$. Their outer opening is oval, and measures 25-30 $\mu$ by 35-40 $\mu$. Both valves are in their hinder part very massive. The thickness of the ventral valve at the beak amounts to about 0·6 mm. This circumstance, together with the somewhat thickened and in many examples distinctly contracted edge, shows with certainty that it has reached a full-grown stage. The colour is a dull lighter or darker coral-red.

The dorsal valve bears conspicuous tooth sockets, the free wall of which posteriorly projects over the hinge in a triangle. In front of the hinge lies a blunt finger-like hinge process. Under this, looking from the inner side, *i.e.*, also dorsal, appears a hinge-plate, depressed in a furrow-like manner in the middle. The hollow space generally existing between the hinge-plate and the wall of the valve is filled up. To the hinge-plate is joined on a stout median septum, reaching as far as the middle or even somewhat further forwards. Its free edge is strongly curved from before backwards, corresponding to the curve of the valve. The brachial apparatus begins with short crura, which bear wide triangular inconspicuous crural processes. The descending limbs reach the median septum widening towards the front, and descending ventrally unite widely with this, run a short distance backwards towards the hinge, and are then united by a bridge somewhat variable in width and position. The brachial apparatus is colourless, or very pale-red. The anterior portion of this is in its general form somewhat variable.

*Dim.*—The size of the largest example before me and of another is:—

Length, 7·5 mm. and 6·5 mm.
Breadth, 4·0 mm. and 3·7 mm.
Thickness, 4·8 mm. and. 4·4 mm.

*Locality*.—Backstairs Passage, near Adelaide, South Australia (Dr. Verco's Coll.).

**Magasella jaffaensis,** n. sp., Blochmann. Pl. xxvii, figs. 6 to 9.

Shell in outline almost circular (fig. 6), or from the middle forwards somewhat narrowed (fig. 8), both valves approximately equally deep and equally curved. Commisures in one plane. Growth striæ, in places distinct or obsolete. Beak short, wide, with moderately sharply-defined edges. Deltidial plates large, joined together. Hole small.

Number of pores, 170-230. Of three examples, one (fig. 8) has the higher number, 212-228; both the others, 170-212. Diameter of the round inner opening of the pores, 20-23 $\mu$; of the outer oval opening, 50 by 30 $\mu$. Colour of the shells found dead, but well preserved, a dirty white.

The dorsal valve has a moderately-developed hinge process, and large tooth sockets with comparatively feeble walls. Between these lies a slightly undermined hinge-plate, sunken towards the middle, which extending as a narrow triangle passes over into the strong median septum. This ends abruptly behind the middle with a slightly curved edge. In the posterior half of its course it remains low, in the anterior it rises to a flat surface twice as high as the hinder portion, which on its ventrally-directed border is split in a furrow-like manner. From the wall of the tooth sockets spring short strong crura, with large slender pointed crural processes. The descending limbs widen rapidly towards the front, and are applied to the anterior elevated part of the septum, so that the edge of the limb, at first dorsal, then directed centrally, approximately strikes upon the middle of this elevated part of the septum. Towards the front they reach far over beyond the front edge of the septum. This strong widened part of the limb coalesces with the septum, so that it does not project forwards over it, then runs narrowing towards the border of the hinge and laterally, bends, still further narrowing, medially again, whereby the two limbs are united by means of a moderately wide bridge. A few small prickles occur at the free anterior border of the part uniting the ascending and descending branch of the limbs. The dorsal and ventral valves are in the posterior part moderately thick; this indicates that the examples are almost or quite mature.

*Dim*.—Size of the largest example: Length, 14·6 mm.; width, 13·5 mm.; thickness, 8 mm.

*Locality*.—Cape Jaffa, South Australia, 90 fathoms.

The form has been closely compared with examples of *Magellania flavescens* of the same size, and is immediately distinguished from them by its general shape, and especially by the very differently-shaped beak, and by the complete absence of ribs, which are already quite plain in really small examples of *M. flavescens*. Again, in the formation of the brachial apparatus distinct differences present themselves. By the general form, one might be reminded of young examples of *M. lenticularis* (the illustration of Davidson, Recent Brachiopoda, pl. ix., figs. 2 to 13), although this is not yet known from the Australian coast. But against this likeness are the much more strongly hook-shaped curved beak in the last-named form, the very small diameter of the inner orifices of the pores (scarcely 10 $\mu$), and the quite distinct pattern on the valves. Also, the brachial apparatus of the young figured example of Davidson is quite different. So it remains only to regard the examples before us as representatives of an independent new species.

**Cistella australis,** n. sp., Blochmann. Pl. xxvii., figs 10 to 12.

Shell as long as broad. Colour dirty-yellow.

Length and breadth are equal, thickness amounts to about one-half of this. Because the dorsal valve is bounded behind by a straight hinge-line, it approaches a semicircle in outline. The complete outline is altered by the triangular beak. The end of the beak is flatly rounded. Its edges are sharp. Between them and the hinge-line is a flat area. Deltidial plates seem wanting. The hole of the beak is large, bounded towards the front to a considerable extent by the hinge-margin of the dorsal valve.

Each valve bears a moderately conspicuous median sinus, and on each side of this three ribs, increasing rapidly in width towards the periphery. These project at the edge as rounded teeth, so that if the posterior corner is included, four rounded teeth are found at the edge, on each side of the notch corresponding to the median sinus. These are not always quite distinct, so that the edge often appears only flatly undulating. Also, variations occur between the right and the left. The growth striæ in both valves are quite distinct. Both valves are about equally deep. There are about 320 pores to the square millimetre; inner diameter of these, about 10 $\mu$; outer diameter, about 15-20 $\mu$; frequently oval, 20 $\mu$ by 10 $\mu$.

The edge of the pedicle hole forms a conspicuous collar. In the ventral valve is found an indistinct median septum

extending to the anterior border. On the right and left of this septum lie deep and extensive muscular impressions. Teeth moderately developed. In the dorsal valve is also found a median septum, which in the posterior half is scarcely distinguishable, but in the anterior half rises as an obtuse triangular process, reaching almost to the ventral valve. The tooth sockets are well developed. At their wall begins the brachial apparatus, the crural processes of which are moderately long and slightly pointed. After a short free course, nearly parallel with the inner surface of the valve, the limbs are applied to the inner surface of the valve, and then cease. Also from the median septum there stretches on either side to the inner surface of the valve a short little band, the ideal continuation of the hinder part of the limb.

*Dim.*—Size of the largest example: Length, 3 mm.; width, 3mm.; thickness, 1·3 mm.

*Locality.*—Cape Willoughby, eastern end of Kangaroo Island (Dr. Verco's Coll.).

### **Cryptopora brazieri,** Crane.

*Atretia brazieri*, Davidson, MS., Crane, Proc. Zool. Soc., Lond., 1886, p. 183; also, *op. cit.*, Dr. T. Davidson on Recent Brachiopoda, Appendix, p. 175, pl. xxv., figs. 16-17*a*. *Type locality*—Port Stephens, New South Wales, at 25 fathoms (J. Brazier).

*Cryptopora brazieri*, Crane; Hedley, Proc. Linn. Soc., New South Wales, 1906, vol. xxxi., part 3, p. 467, pl. xxxvi., figs. 1 and 2. Common at 17-20 fathoms around Masthead Island, Queensland.

Dredged at 6 fathoms, off St. Francis Island, 2 alive; at 40 fathoms, off Beachport, 2 good; at 49 fathoms, off Cape Jaffa, 1 perfect; at 62 fathoms, off Cape Borda, 27 perfect; at 90 fathoms, off Cape Jaffa, large numbers; at 104 fathoms, 35 miles south-west of Neptune Islands, 20 perfect; at 110 fathoms, off Beachport, 10 perfect; at 130 fathoms, off Cape Jaffa, 5 moderate; at 150 fathoms, off Beachport, 2 dead; at 300 fathoms, off Cape Jaffa, 4 dead. Its habitat in our waters seems to be at a depth of 60 to 110 fathoms. I have never taken it at so low a depth as 20 fathoms, that at which Mr. Hedley secured it in Queensland.

### **Liothyris wyvillei,** Davidson.

*Terebratula wyvilli*, Davidson, Proc. Roy. Soc., Lond., vol. xxviii., p. 436, 1878; also "Challenger" Rep. Zool., vol. I., 1880, p. 27, pl. ii., figs. 7 and 8.

*Liothyris wyvillii*, Davidson, Proc. Linn. Soc., Lond., 1886, p. 15, pl. ii., figs. 8-14. *Type locality*—Off South Australia, in lat. 42° 42′ S., long. 134° 10′ E.; depth, 2,600 fathoms. Also off the coasts of Chili, Patagonia, and the Falkland Islands.

## **Terebratulina cancellata,** Koch.

*Terebratula cancellata*, Koch, in Küster, Conch.-Cab., 1843, Band vii., Abt. i., p. 35, pl. 2*b*, figs. 11-13. *Type locality*—Western Australia; Sowerby, Thes. Conch., 1846, p. 358, pl. lxxi., figs. 93-95, no locality cited.

*Terebratula (Terebratulina) cancellata*, Reeve, Conch. Icon., 1860, pl. iv., fig. 13.

*Terebratulina cancellata*, Dall., Proc. Acad. Nat. Sci., Philadelphia, 1873, p. 179. Davidson, "Challenger" Rep. Zool., 1880, vol. i., p. 37, pl. i., figs. 11-16, 35 to 40 fathoms, Bass Strait; also, Trans. Linn. Soc., Lond., 1886, Recent Brachiopoda, p. 35, pl. vi., figs. 1-8; Hedley, Memoirs Austr. Mus., 1902, vol. iv., p. 288, 50 to 60 fathoms, off Jibbon; Hedley and May, Records Austr. Mus., 1908, vol. vii., No. 2, p. 114, 100 fathoms, off Cape Pillar, Tasmania.

Dredged alive at 15 fathoms in Backstairs Passage, 4; at 16, 17, 18, 20, and 22 fathoms, very many; at 30 fathoms, off Corney Point, Spencer Gulf, 17; at 40 fathoms, off Beachport, 3. alive and 11 dead, all small; at 55 fathoms, off Cape Borda, 1 alive 11 dead, all small, and at 60 fathoms, 10 dead, small; at 90 fathoms, off Cape Jaffa, 2 minute, dead; at 110 fathoms, off Beachport, 4 minute and 13 small, dead, and at 150 fathoms, 3 minute. It occurs in both our gulfs and both straits, and has its habitat from 15 to 30 fathoms. It may occur in shallower waters (in which I have dredged very seldom), as it has been taken in Port Jackson by Brazier in 3 and 7 fathoms. The "Challenger" took it abundantly in 35 to 40 fathoms. Beyond that depth only very immature specimens have been obtained by me.

## **Terebratulina cavata,** n. sp., Verco. Pl. xxviii., figs. 1 to 5.

Shell thin-walled, translucent, oval, widest a little in front of the middle. Ventral valve very little deeper than the dorsal, convex longitudinally, especially towards the beak, transversely convex, slightly centrally flattened; lateral edges slightly concave, front slightly convex. Beak very short, obliquely truncated. Foramen of moderate size, incomplete, the anterior eighth formed by the back of the dorsal valve, bevelled from the outer to the inner edge. Deltidial plates narrow triangular, not meeting in the middle line. Teeth small, projecting inwards and backwards. Dorsal valve convex longitudinally and transversely, slightly prominent centrally, and sloping at the sides; lateral edges convex, anterior edge slightly concave. Hinge line narrow and straight. Tooth sockets well developed, excurved, and pointed ventrally. Crura rather short and stout. Loop annular, completed by a ventrally convex ventral crural

band; the side pieces are shallow and project obliquely forward; the dorsal band is longitudinally wide, concave dorsally, projecting well in advance of the ventral band, and with a deep, nearly square, sinus in its posterior edge (whence the specific name).

*Sculpture.*—Longitudinal ribs, about 12 at first, flatly triangular, crenulating the edge of the foramen, and increasing by trichotomous division. Growth lines scarcely visible; some irregularly-distant concentric shallow grooves.

*Dim.*—Length, 16·25 mm.; width, 11·5 mm.; depth, 7 mm. The largest is 14 mm. wide. Another is 17·5 mm. by 12·25 mm.

*Locality.*—Type locality, at 130 fathoms, off Cape Jaffa, 37 examples, all dead (7 probably nearly or quite full grown, 5 small, and 25 very small); also, at 300 fathoms, 4 mature, 13 small, and 76 very small.

*Diagnosis.*—*T. cancellata*, Koch, is closely allied, but is flatter, has more numerous, rounder, rougher riblets arising by irregular intercalation; its loop is wider, and has narrower bands, and the dorsal bridge has posteriorly a blunt central projection instead of a sinus.

### **Magellania flavescens**, Lamarck.

*Terebratula flavescens*, Lamarck, Anim. S. Vert., vol. iv., 1819, p. 246, also vol. vii., 1836, p. 330. *Type locality*—The seas of India to Java. Conch.-Cab., Band vii., Abt. i., p. 45, sp. 27, pl. 2*d*, fig. 4.

*Terebratula australis*, Quoy and Gaimard, Voy. de l'Astr., 1834, Moll., vol. v., p. 551, pl. lxxxv., figs 1-5, Port Western, Vict.; Sowerby, Thes. Conch., 1847, p. 349, sp. 13, pl. lxix., figs. 25-33.

*Terebratula dentata*, Lamarck, Anim. S. Vert., 1836, vol. vii., p. 331. *Type locality*—The southern seas (?), Peron.

*Terebratula incurva*, Quoy and Gaimard, *loc. cit.*, p. 554, pl. lxxxix., figs. 11 and 12.

*Waldheimia flavescens*, Lamarck, Reeve, Conch. Icon., 1860, pl. 1 and 2, figs. 1*a*, *b*; Tenison-Woods, Proc. Roy. Soc., Tasm., 1878 (1877), p. 57, north coast of Tasmania; Davidson, "Challenger" Rep. Zool., vol. i., 1880, p. 41, pl. iii., figs. 10-12; also, Proc. Linn. Soc., Lond., vol. iv., 1886, p. 41, pl. vii., figs. 6-19; Hedley, Memoirs Austr. Mus., vol. iv., 1902, p. 289, 11 to 15 fathoms, off the Crookhaven River.

*Magellania flavescens*, Lamarck, Tate and May, Proc. Linn. Soc., New South Wales, vol. xxvi., 1901, p. 441.

Found all along the South Australian coast, as far as Point Sinclair. Dredged alive at all depths from 6 to 30 fathoms in numbers; at 40 fathoms, off Beachport, 10, from very minute to 1 quarter-grown; and at 100 fathoms, 19 minute, alive.

**Magasella cumingi,** Davidson.

*Terebratella (?) cumingii*, Davidson, Ann. and Mag., Nat. Hist. 1852, 2nd ser., vol. ix., p. 368, and Proc. Zool. Soc., Lond., 1852, p. 78, pl. xiv., figs. 10-16.

*Terebratula (Bouchardia) cumingii*, Reeve, Conch. Icon., 1861, pl. viii., fig. 30.

*Magasella cumingii*, Davidson, "Challenger" Rep. Zool., vol. i., 1880, p. 48.

*M. cumingi*, Davidson, Proc. Zool. Soc., Lond., 1886, p. 97, sp. 54, pl. xvii., figs. 23-32.

*Magas cumingi*, Davidson, Angas, Proc. Zool. Soc., Lond., 1867, p. 935, "deep water outside Port Jackson Heads."

*Terebratula (Bouchardia) fibula*, Reeve, Conch. Icon., 1861, pl. viii., fig. 30.

Dredged in both gulfs and both straits at 12 fathoms, 75 alive; at 13 fathoms, 6 alive; at 15 fathoms, 51 alive; at 17 fathoms, 83 alive; at 20 fathoms, very many; at 22 fathoms, great numbers; at 27 fathoms, 2 alive; at 30 fathoms, several dead; at 35 fathoms, off St. Francis Island, 2 alive; at 40 fathoms, off Beachport, 15 small, dead; and at 49 fathoms, 24 small, dead; at 55 fathoms, off Cape Borda, 7 small, dead; and at 62 fathoms, 27 small, dead; at 90 fathoms, Cape Jaffa, 10 minute; at 110 fathoms, Beachport, 20 perfect (several alive up to full-grown); at 130 fathoms, Cape Jaffa, 26 minute and up to adult; at 150 fathoms, Beachport, 19 perfect, small, and 15 valves; and at 200 fathoms, 7 dead, very poor.

**Magasella exarata,** n. sp, Verco. Pl. xxviii., figs. 6 to 8.

Shell small, solid, oval, compressed dorso-ventrally, white. Dorsal valve nearly flat, with a shallow median furrow widening anteriorly; slightly convex longitudinally and transversely; lateral margin sinuous, convexo-concave from behind, and convex in front to correspond with the median sinus. Ventral valve twice as deep as the dorsal, uniformly convex longitudinally. Beak projecting considerably beyond the hinge line, solid, slightly curved dorsally. Foramen triangular, completed in front by the dorsal valve, rounded behind, and not extending to the end of the beak; bounded at the sides by a solid, stout, low lamina. Sculpture, numerous axial diverging riblets, increasing by intercalation, with concentric riblets, somewhat irregular in size and distance. Border internally plicately toothed. The hinge teeth in the ventral valve are very low and small and tubercle-like. In the dorsal valve the laminæ on the inside of the tooth sockets are prominent and solid. From the anterior end of their bases two short stout processes project forwards ventrally, and converge without uniting. Two

low ridges also extend forwards on the wall of the valve from the bases of the laminæ, and unite just in front of its centre, and continue as an obsolete ridge to the front margin.

*Dim.*—Length, 7·75 mm.; width, 5·5 mm.; depth, 2 mm.

*Diagnosis.*—*M. cumingi*, Davidson, is smooth, without external sculpture, and has a fine foramen at the end of the beak.

*Locality.*—Type, at 150 fathoms, off Beachport, with 1 other good and 1 of a narrower form; also, at 40 fathoms, 2 good, and at 110 fathoms, 1 good and 1 valve; at 49 fathoms, off Cape Jaffa, 1 small.

**Magasella vercoi,** Blochmann, *antea.*

I may add to the locality given by the author.

Dredged in Backstairs Passage, at 16 to 18 fathoms, 15 alive, many dead; at 19 fathoms, a great many alive and dead, probably 200; at 20 fathoms and at 22 fathoms, very many; at 40 fathoms, off Beachport, 2 good and 3 moderate; at 62 fathoms, off Cape Borda, 2 poor; at 110 fathoms, off Beachport, 3 good and 9 moderate; at 130 fathoms, off Cape Jaffa, 2 poor, 21 poor and rolled; at 150 fathoms, off Beachport, 2 good, quite white; and at 200 fathoms, 2 valves, poor.

Its habitat seems to be just about Backstairs Passage from 15 to 22 fathoms, beyond which it is rare and dead.

This is the shell which Tate recorded as *Megerlia willemoesi*, Davidson, from 22 fathoms, in Encounter Bay (R. H. Pulleine), in Trans. Roy. Soc. of S. Austr., vol. ix., 1886, p. 110.

**Magasella jaffaensis,** Blochmann, *antea.*

I may add to the locality given by the author.

Dredged, all dead, off Cape Jaffa, at 90 fathoms, 35 large and small, and 24 very small; at 130 fathoms, 17 moderate size, 2 small; at 300 fathoms, 16 good, very small, and 6 very poor; at 110 fathoms, off Beachport, 4 good; at 150 fathoms, 8 moderate; at 200 fathoms, 8 moderate, 1 good, and 6 valves.

**Kraussina (Megerlina) lamarckiana,** Davidson.

*Kraussia lamarckiana*, Davidson, Proc. Roy. Soc., Lond., 1852, p. 80, pl. xiv., figs. 22 and 23. *Type locality*—Sydney. H. and A. Adams, The Genera of Recent Mollusca, vol. ii., p. 579, 1858.

*Terebratula (Kraussia) lamarckiana*, Davidson; Reeve, Conch. Icon., pl. ix., fig. 34, 1861.

*Kraussina lamarckiana*, Davidson; Chenu, Man. de Conch., 1862, vol. ii., p. 206, fig. 1057; Tenison-Woods, Proc. Roy. Soc., Tasm., 1878 (1877), p. 57, Long Bay, Tasmania; Davidson, "Challenger" Rep. Zool., vol. i., 1880, p. 53, pl. iv., fig. 9.

Dredged alive off Cape Willoughby, Kangaroo Island, at 20 fathoms, 10 alive; at 17 fathoms, off Point Marsden, Kangaroo Island, 1 alive; at 62 fathoms, off Cape Borda, 1 dead; at 110 fathoms, off Beachport, 1 dead. Taken on the beach at Guichen, Holdfast, and Fowler Bays and on St. Francis Island.

**Kraussina atkinsoni**, Tenison-Woods.

*Kraussia atkinsoni*, Tenison-Woods, Proc. Roy. Soc., Tasm., 1878 (1877), p. 57. *Type locality*—Long Bay.

*Kraussina*, etc.; Davidson, Proc. Linn. Soc., Lond., 1887 (1886), p. 127, pl. xxi., figs. 5 and 6; Twelvetrees and Petterd, Proc. Roy. Soc., Tasm., 1900, p. 90, fig. 4; Tate and May, Proc. Linn. Soc., New South Wales, 1901, vol. xxvi., p. 442.

Taken on the beach at Robe, and at Venus Bay, rare.

**Cistella australis**, Blochmann, *antea*.

Dredged in 20 fathoms, off Cape Willoughby, Kangaroo Island, 7 alive.

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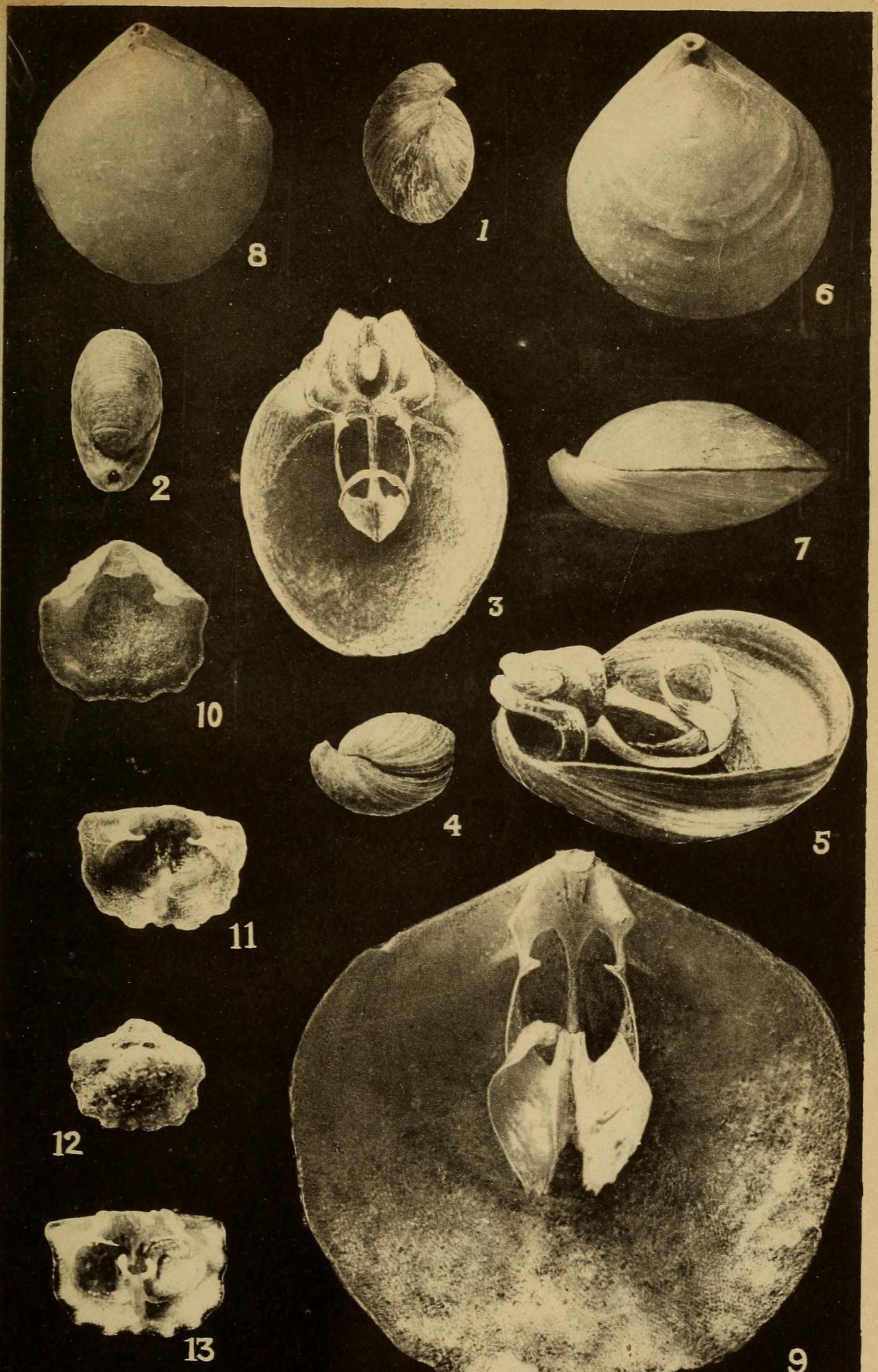
## EXPLANATION OF PLATES.

### Plate XXVII.

Fig. 1. *Magasella vercoi*, Blochmann, side view.
" 2. " " " dorsal view.
" 3. " " " interior.
" 4. " " " side view.
" 5. " " " inclined side view of interior.
" 6. *Magasella jaffaensis*, Blochmann, dorsal view.
" 7. " " " side view.
" 8. " " " dorsal view.
" 9. " " " interior.
" 10. *Cistella australis*, Blochmann, interior of ventral valve.
" 11. " " " interior of dorsal valve.
" 12. " " " dorsal view.
" 13. " *cuneata*, Risso, interior, for comparison.

### Plate XXVIII.

Fig. 1. *Terebratulina cavata*, Verco, ventral valve, interior.
" 2. " " " dorsal valve, exterior.
" 3. " " " ventral valve, side view.
" 4. " " " dorsal valve, side view.
" 5. " " " brachial apparatus.
" 6. *Magasella exarata*, Verco, side view.
" 7. " " " dorsal view.
" 8. " " " brachial apparatus.

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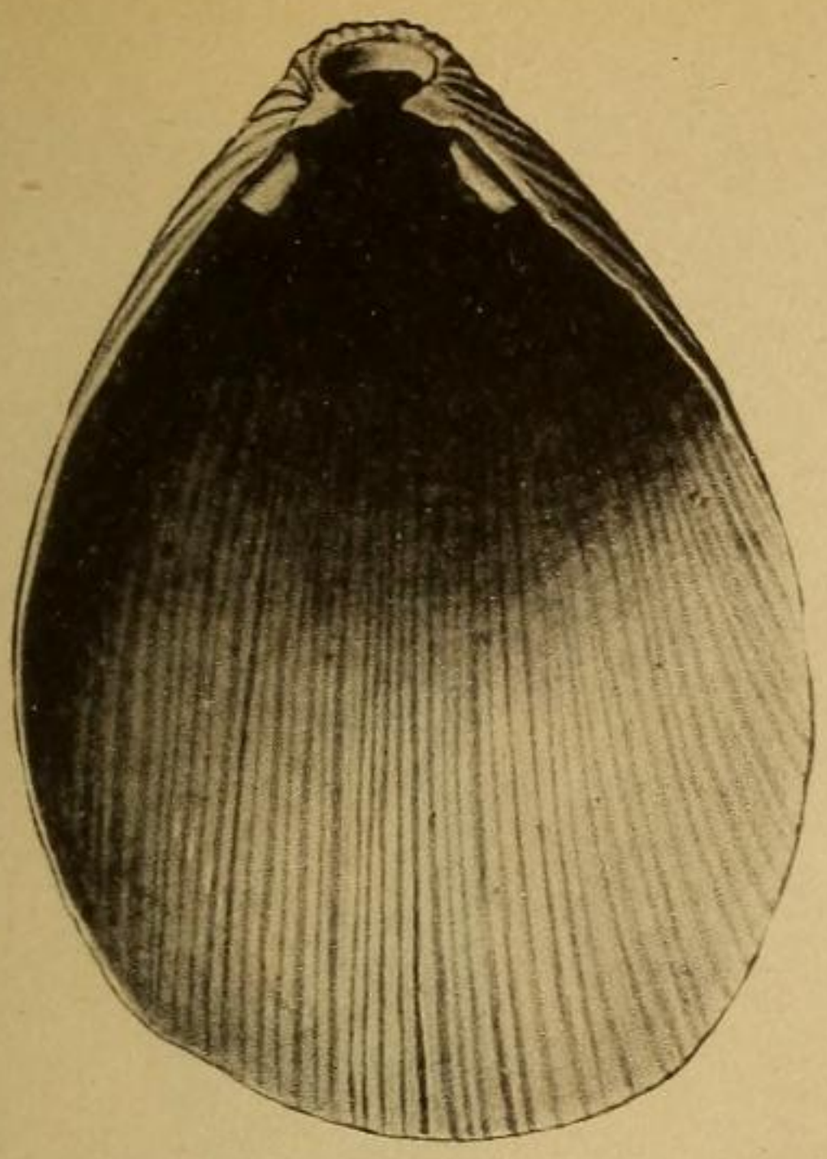

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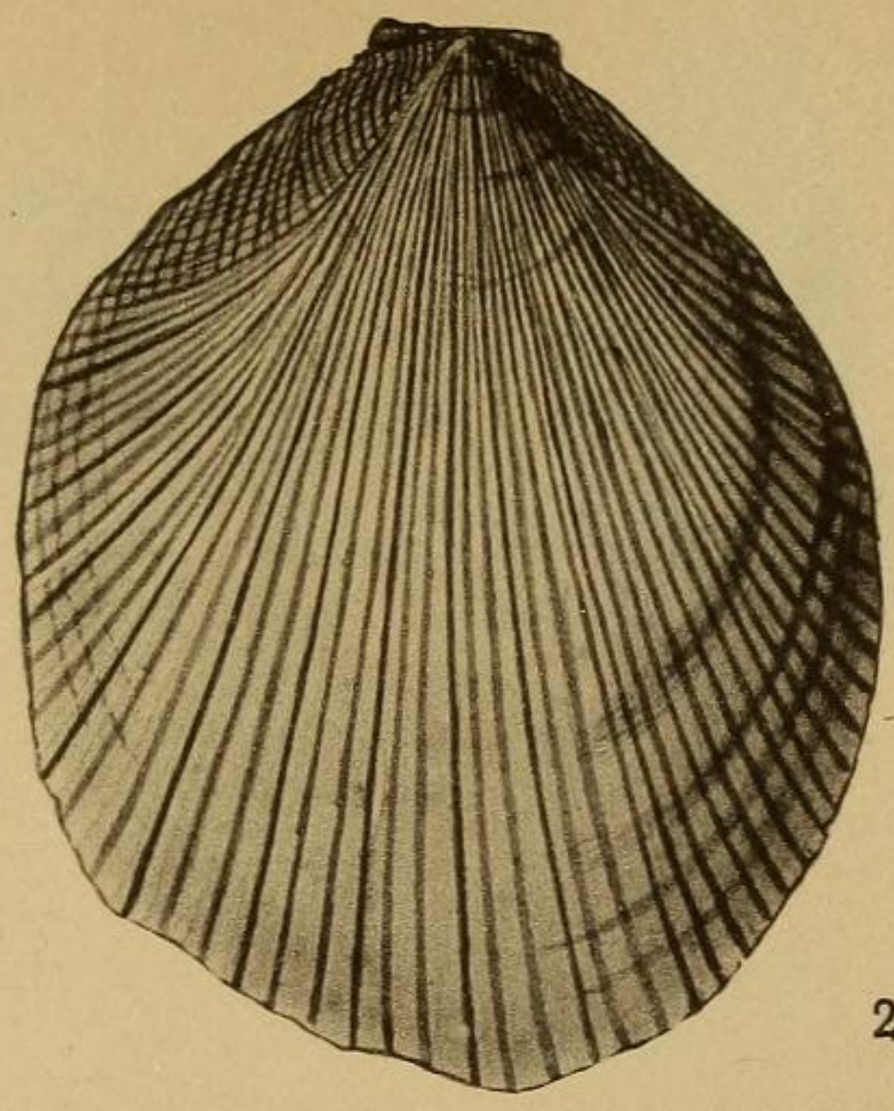

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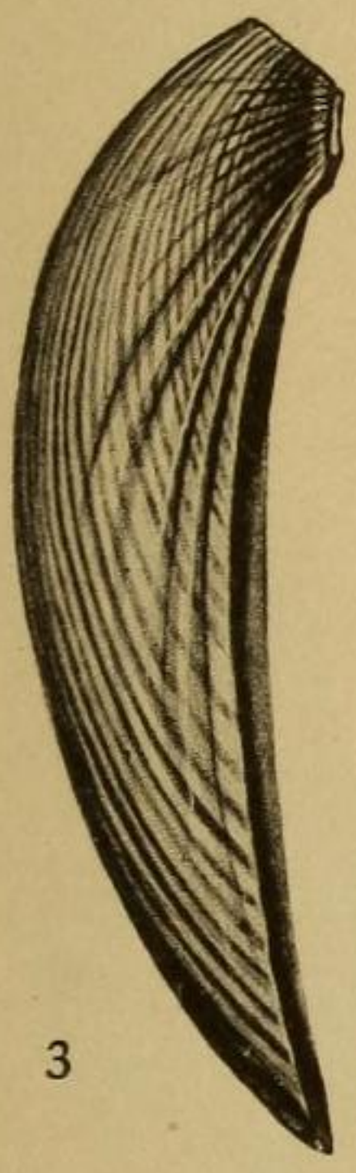

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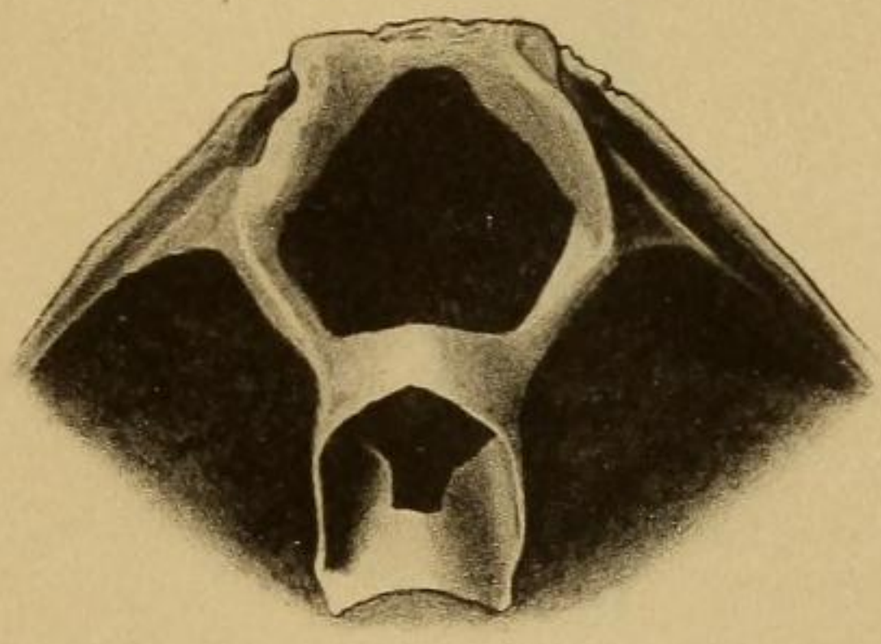

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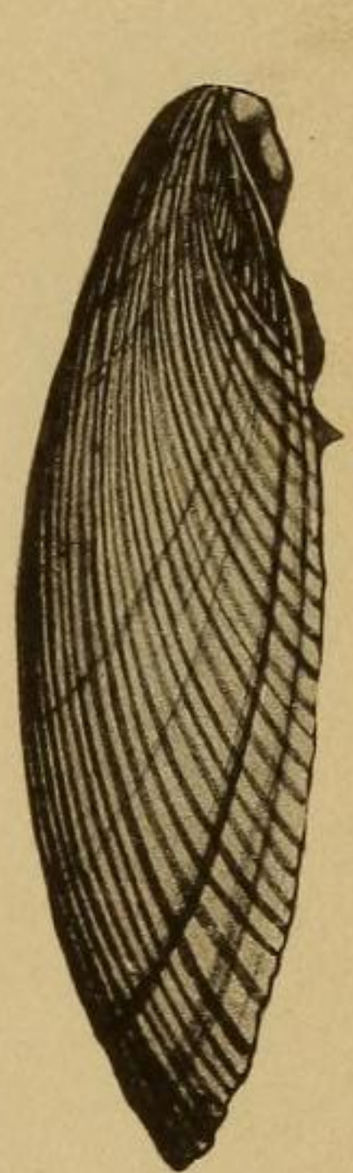

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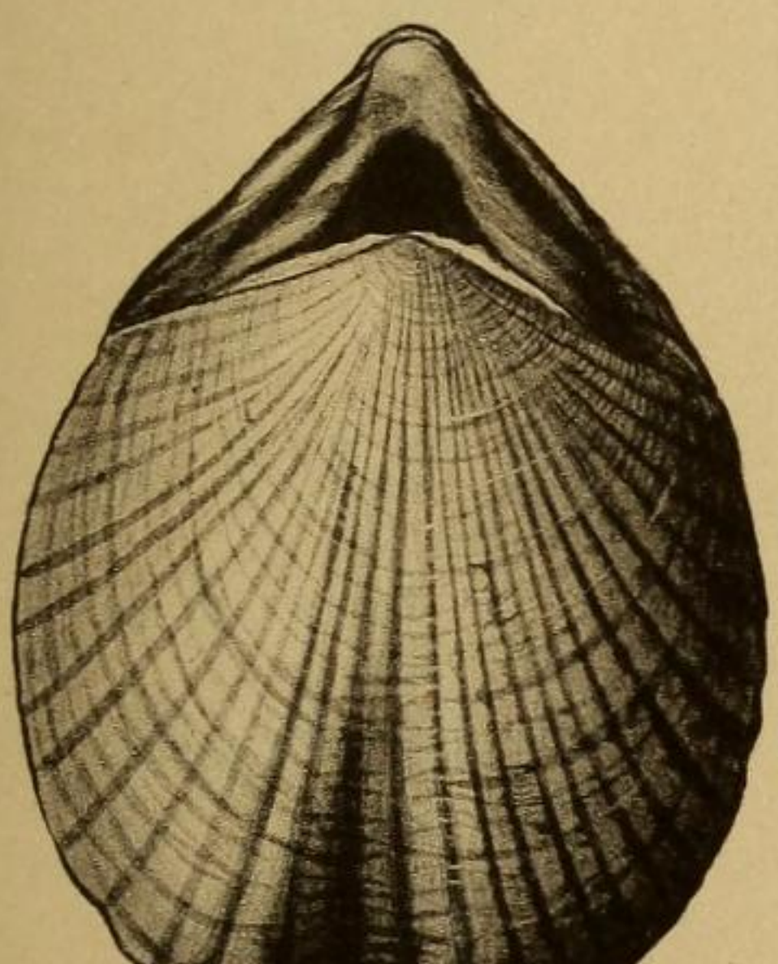

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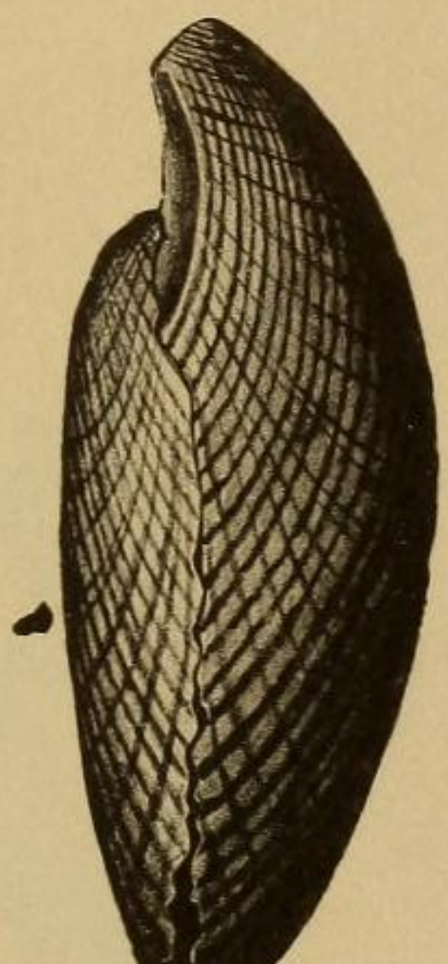

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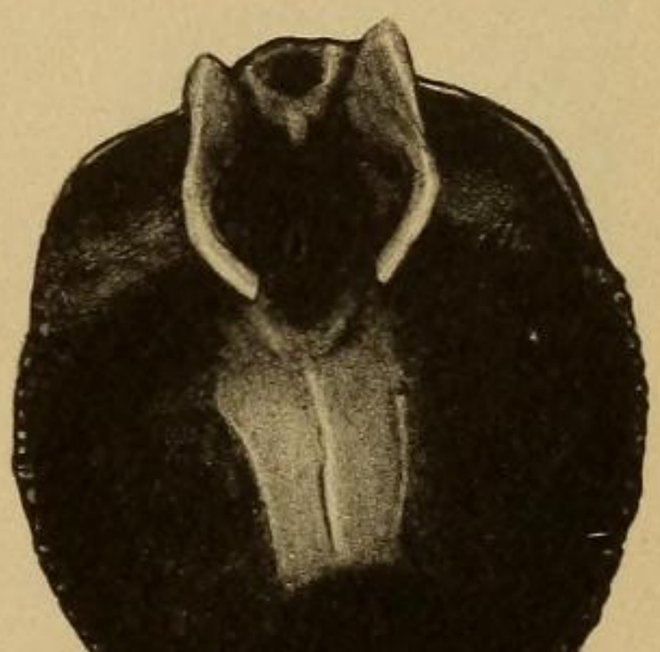

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# THE BRACHIOPODS OF SOUTH AUSTRALIA.

By Jos. C. Vbrco, M.D. (Lond.), F.R.C.S. (Eng.), etc.

[Read April 5, 1910.]

Plates XXVII. and XXVIII.

In November, 1906, Professor F. Blochmann, of the Zoological Institute of the University of Tubingen, wrote to Professor Stirling, Director of the Adelaide Museum, requesting the loan of its Brachiopod material, so as to permit of his investigating the South Australian forms. He was working up the Brachiopods of the Valdivia and Gauss Expedition, and had been led into some important questions concerning the geographical distribution of the members of this group. As the Museum material was meagre, Professor Stirling passed the letter on to me, and I sent Professor Blochmann all our well-known forms, and as many other species as I had then separated, from the shells dredged during several years.

In the early part of this year he forwarded a communication to be used at my discretion, either as a paper by

Professor Blochmann, presented by me, to be published in the Transactions of the Royal Society of South Australia, or as material for me to use in compiling a paper of my own. To combine the two ideas seemed the proper course, and with the acquiescence of the Council I present a paper on the Brachiopods of South Australia, which will deal with all the species hitherto found in our waters, and will incorporate Professor Blochmann's descriptions of his three new species, translated from his manuscript, and attributed, as they should be, to him as their author. We are indebted to him for the photographs of his three species. My remaining material has supplied two other new species, which I have described and figured.

The late Professor Tate, in a Revision of the Recent Lamellibranch and Palliobranch Mollusca of South Australia, Trans. Roy. Soc. of S. Austr., vol. ix., 1886, p. 76 to p. Ill, enumerated five Brachiopods, namely, W aldh eimid flavescens, Lamarck, now called Magellania flavescens; Terebratella cancellata, Koch, now Terebratulina cancellata ; Megerlia willemcesi, Davidson, which was a misidentification, and is the Magasella vercoi, Blochmann, n. sp. ; Kraussina lamarckiana, Davidson, which remains unaltered : and

**[Begin Page: Page 90]**

Orbicula tenuis, Sowerby, reported from Chili and Port Lincoln : this latter locality is certainly erroneous, no collector having taken it, so it is erased from our list.

In vol. xi., op. cit., 1888, p. 69, Professor Tate added Magasella cumingi, Davidson: and in vol. xiv., 1891, p. 26$, Terebratula wyvillei, Davidson, dredged by the "Challenger" in lat. 42° 22', which is a considerable distance off our shores. This is now named Liothyris wyvillei.

To the five species, belonging to five different genera above recorded by Professor Tate, we are able to add in this paper two previously-described species, viz., Kraussina atkinsoni, Tenison-AVoods, and Crypt opora brazieri. Crane: and five species hitherto undescribed, viz., Magasella vercoi and M. jaffaensis and Cistetta australis, all of Blochmann ; and Magasella radiata and Terebratulina cavata, both of Verco, bringing our number up to twelve sjDecies belonging to seven genera.

## NEW BRACHIOPODS FROM SOUTH AUSTRALIA.

By F. Blochmann, Tubingen.

Dr. Verco, of Adelaide, had the kindness to place in my hands a large number of Brachiopods for classification which he had collected off the coast of South Australia. For this I tender him my best thanks. The material embraced, be-

sides well-known species from these waters, such as Magellania fin retreat, Magasella cumingi and Kraussina lamarckiana, two Magasellas and one Cist ell a. About the first two, Dr. Verco properly presumed that they were forms hitherto unknown : the last he believed was Cistetta cuneata, which from want of material for comparison is easily explicable. This species is also new. I give below an accurate description of the three species, and remark as follows : —Some authors question whether Brachiopods of the type of Magasella are independent forms, and are only immature stages of Terebratella — even though becoming sexually mature — but I hold this view is not correct in all cases. Among the examples of Magasella vercoi described hereafter, and also among the examples of M . cumingi sent to me by Dr. Verco are found, in considerable number, those which present all the marks of quite full-grown animals, especially a striking thickening of the shells in part, with loss of much of the more delicate sculpture; so that any further development of these forms is with certainty excluded. The genus Magasella is to be retained. I will return to this in fuller detail in another place.

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Magasella vercoi, n. sp., Blochmann. PI. xxvii., tigs. 1 to 5. Shell small, in outline of a slender pear shape, higher

than wide, remarkably thickwalled, light to dark dull coral-red, with a conspicuous finger-shaped hinge process. The greatest width is somewhat in front of the centre. Beak stout, rather strongly bent dorsalwards, and then obliquely truncate, with a moderately large hole. Its sides are rounded, and towards the deltidial plate are finished off in a sharp edge. Deltidial plates large, joining together widely. Lateral edge of the ventral valve in the neighbourhood of the teeth raised dorsally in a low point, further forwards curving ventrally. Front edge distinctly convex dorsally.

Both valves are nearly equally deep. The accremental stria? are in both quite distinct. To the square millimetre there are about 216 pores, the inner diameter of which amounts to 20 /a. Their outer opening is oval, and measures 25-30 jut by 35-40^. Both valves are in their hinder part very massive. The thickness of the ventral valve at the beak amounts to about 0'6 mm. This circumstance, together with the somewhat thickened and in many examples distinctly contracted edge, shows with certainty that it has reached a full-grown stage. The colour is a dull lighter or darker coral -red.

The dorsal valve bears conspicuous tooth sockets, the free wall of which posteriorly projects over the hinge in a triangle. In front of the hinge lies a blunt finger-like hinge process. Under this, looking from the inner side, i.e., also dorsal, appears a hinge-plate, depressed in a furrow-like manner in the middle. The hollow space generally existing

between the hinge-plate and the wall of the valve is filled up. To the hinge-plate is joined on a stout median septum, reaching as far as the middle or even somewhat further forwards. Its free edge is strongly curved from before backwards, corresponding to the curve of the valve. The brachial apparatus begins with short crura, which bear wide triangular inconspicuous crural processes. The descending limbs reach the median septum widening towards the front, and descending ventrally unite widely with this, run a short distance backwards towards the hinge, and are then united by a bridge somewhat variable in width and position. The brachial apparatus is colourless, or very pale-red. The anterior portion of this is in its general form somewhat variable.

Dim. — The size of the largest example before me and of another is: —

Length, 7*5 mm. and 6*5 mm.

Breadth, 4'0 mm. and 3'7 mm.

Thickness, 4*8 mm. and. 4'4 mm.

**[Begin Page: Page 92]**



Locality. — Backstairs Passage, near Adelaide, South

Australia (Dr. Verco's Coll.).

Magasella jaffaensis, n. sp., Blochmann. PI. xxvii., figs. 6 to 9.

Shell in outline almost circular (fig. 6), or from the middle forwards somewhat narrowed (fig. 8), both valves approximately equally deep and equally curved. Commisures in one plane. Growth striae, in places distinct or obsolete. ,Beak short, wide, with moderately sharply-defined edges. Deltidial plates large, joined together. Hole small.

Number of pores, 170-230. Of three examples, one (fig. 8) has the higher number, 212-228 ; both the others, 170-212. Diameter of the round inner opening of the pores, 20-23 /x; of the outer oval opening, 50 by 30 ja. Colour of the shells found dead,, but well preserved, a dirty white.

The dorsal valve has a moderately-developed hinge process, and large tooth sockets with comparatively feeble walls. Between these lies a slightly undermined hinge-plate, sunken towards the middle, which extending as a narrow triangle passes over into the strong median septum. This ends abruptly behind the middle with a slightly curved edge. In the posterior half of its course it remains low, in the anterior it rises to a flat surface twice as high as the hinder portion, which on its ventr ally- directed border is split in a furrow-like manner. From the wall of the tooth sockets spring

short strong crura, with large slender pointed crural processes. The descending limbs widen rapidly towards the front, and are applied to the anterior elevated part of the septum, so that the edge of the limb, at first dorsal, then directed centrally, approximately strikes upon the middle of this elevated part of the septum. Towards the front they reach far over beyond the front edge of the septum. This strong widened part of the limb coalesces with the septum, so that it does not project forwards over it, then runs narrowing towards the border of the hinge and laterally, bends, still further narrowing, medially again, whereby the two limbs are united by means of a moderately wide bridge. A few small prickles occur at the free anterior border of the part uniting the ascending and descending branch of the limbs. The dorsal and ventral valves are in the posterior part moderately thick; this indicates that the examples are almost or quite mature.

Dim. — Size of the largest example: Length, 14*6 mm.; width, 13*5 mm. ; thickness, 8 mm.

Locality. — Cape Jaffa, South Australia, 90 fathoms.

**[Begin Page: Page 93]**



The form has been closely compared with examples of

Magellania flavescens of the same size, and is immediately distinguished from them by its general shape, and especially by the very differently-shaped beak, and by the complete absence of ribs, which are already quite plain in really small examples of M. flavescens. Again, in the formation of the brachial apparatus distinct differences present themselves. By the general form, one might be reminded of young examples of M . lenticularis (the illustration of Davidson, Recent Brachiopoda, pi. ix., figs. 2 to 13), although this is not yet known from the Australian coast. But against this likeness are the much more strongly hook-shaped curved beak in the last-named form, the very small diameter of the inner orifices of the pores (scarcely 10 /x), and the quite distinct pattern on the valves. Also, the brachial apparatus of the young figured example of Davidson is quite different. So it remains only to regard the examples before us as representatives of an independent new species.

Cistella australis, n. sp., Blochmann. PI. xxvii., figs 10 to 12.

Shell as long as broad. Colour dirty-yellow.

Length and breadth are equal, thickness amounts to about one-half of this. Because the dorsal valve is bounded behind by a straight hinge-line, it approaches a semicircle in outline. The complete outline is altered by the triangular beak. The end of the beak is flatly rounded. Its edges are sharp. Between them and the hinge-line is a flat area.

Deltidial plates seem wanting. The hole of the beak is large, bounded towards the front to a considerable extent by the hinge-margin of the dorsal valve.

Each valve bears a moderately conspicuous median sinus, and on each side of this three ribs, increasing rapidly in width towards the periphery. These project at the edge as rounded teeth, so that if the posterior corner is included, four rounded teeth are found at the edge, on each side of the notch corresponding to the median sinus. These are not always quite distinct, so that the edge often appears only flatly undulating. Also, variations occur between the right and the left. The growth striae in both valves are quite distinct. Both valves are about equally deep. There are about 320 pores to the square millimetre ; inner diameter of these, about 10 /x; outer diameter, about 15-20 /i; frequently oval, 20 p by 10 ,x.

The edge of the pedicle hole forms a conspicuous collar. In the ventral valve is found an indistinct median septum

**[Begin Page: Page 94]**



extending to the anterior border. On the right and left of this septum lie deep and extensive muscular impressions. Teeth moderately developed. In the dorsal valve is also

found a median septum, which in the posterior half is scarcely distinguishable, but in the anterior half rises as an obtuse triangular process, reaching almost to the ventral valve. The tooth sockets are well developed. At their wall begins the brachial apparatus, the crural processes of which are moderately long and slightly pointed. After a short free course, nearly parallel with the inner surface of the valve, the limbs are applied to the inner surface of the valve, and then cease. Also from the median septum there stretches on either side to the inner surface of the valve a short little band, the ideal continuation of the hinder part of the limb.

Dim. — Size of the largest example : Length, 3 mm. ; width, 3mm. ; thickness, 1*3 mm.

Locality. — Cape Willoughby, eastern end of Kangaroo Island (Dr. Verco's Coll.).

Cryptopora brazieri, Crane.

Atretia brazieri, Davidson, MS., Crane, Proc. Zool. Soc, Lond., 1886, p. 183; also, op. cit., Dr. T. Davidson on Recent Brachiopoda, Appendix, p. 175, pi. xxv., figs. 16-1 la. Type locality — Port Stephens, New South Wales, at 25 fathoms (J. Brazier).

Cryptopora brazieri, Crane; Hedley, Proc. Linn. Soc, New South Wales, 1906, vol. xxxi., part 3, p. 467, pi. xxxvi., figs. 1

and 2. Common at 17-20 fathoms around Masthead Island, Queensland.

Dredged at 6 fathoms, off St. Francis Island, 2 alive; at 40 fathoms, off Beachport, 2 good ; at 49 fathoms, off Cape Jaffa, 1 perfect : at 62 fathoms, off Cape Borda, 27 perfect; at 90 fathoms, off Cape Jaffa, large numbers; at 104 fathoms, 35 miles south-west of Neptune Islands, 20 perfect : at 110 fathoms, off Beachport. 10 perfect; at 130 fathoms, off Cape Jaffa, 5 moderate ; at 150 fathoms, off Beachport, 2 dead ; at 300 fathoms, off Cape Jaffa, 4 dead. Its habitat in our waters seems to be at a depth of 60 to 110 fathoms. I have never taken it at so low a depth as 20 fathoms, that at which Mr. Hedley secured it in Queensland.

Liothyris wyvillei, Davidson.

Terebratula wyvilli, Davidson, Proc. Roy. Soc, Lond., vol. xxviii.. p. 436, 1878; also 'Challenger" Rep. Zool., vol. I., 1880, p. 27, pi. ii., figs. 7 and 8.

Liothyris wyvillii, Davidson, Proc. Linn. Soc, Lond., 1886, p 15, pi. ii., figs. 8-14. Ti/pr locality—Off South Australia, in lat. 42° 42' S., lone. 134 c 10' E. ; depth, 2,600 fathoms. Also off the roasts of Chili, Patagonia, and the Falkland Islands.

**[Begin Page: Page 95]**

Terebratulina cancellata, Koch.

Terebratula cancellata, Koch, in Kuster, Conch. -Cab., 1843, Band vii., Abt. i., p. 35, pi. 2b, figs. 11-13. Type locality- Western Australia; So^yerby, Thes. Conch., 1846, p. 358, pi. lxxi., figs. 93-95, no locality cited.

Terebratula (Terebratulina) cancellata. Reeve, Couch. Icon., 1860, pi. iv., fig. 13.

Terebratulina cancellata, Dall., Proe. Acad. Nat. Sci., Philadelphia, 1873, p. 179. Davidson, "Challenger" Rep. Zool., 1880, vol. i., p. 37, pi. i., figs. 11-16, 35 to 40 fathoms, Ba&s Strait; also, Trans. Linn. Soc, Lond., 1886, Recent Brachiopoda, p. 35, pi. vi., figs. 1-8: Hedley, Memoirs Austr. Mus., 1902, vol. iv., p. 288, 50 to 60 fathoms, off Jibbon ; Hedlev and May, Records Austr. Mus., 1908, vol. vii., No. 2, p. 114, 100 fathoms, off Cape Pillar, Tasmania.

Dredged alive at 15 fathoms in Backstairs Passage, 4; at 16, 17, 18, 20, and 22 fathoms, very many; at 30 fathoms, off Corney Point, Spencer Gulf, 17 ; at 40 fathoms, off Beachport, 3. alive and 11 dead, all small ; at 55 fathoms, off Cape Borda, 1 alive 11 dead, all small, and at 60 fathoms, 10 dead, small ; at 90 fathoms, off Cape Jaffa, 2 minute, dead ; at 110 fathoms, off Beachport, 4 minute and 13 small, dead,

and at 150 fathoms, 3 minute. It occurs in both our gulfs and both straits, and has its habitat from 15 to 30 fathoms. It may occur in shallower waters (in which I have dredged very seldom), as it has been taken in Port Jackson by Brazier in 3 and 7 fathoms. The "Challenger" took it abundantly in 35 to 40 fathoms. Beyond that depth only very immature specimens have been obtained by me.

Terebratulina cavata, n. sp., Verco. Pl. xxviii., figs. 1 to 5.

Shell thin-walled, translucent, oval, widest a little in front of the middle. Ventral valve very little deeper than the dorsal, convex longitudinally, especially towards the, beak, transversely convex, slightly centrally flattened ; lateral edges slightly concave, front slightly convex. Beak very short, obliquely truncated. Foramen of moderate size, incomplete, the anterior eighth formed by the back of the dorsal valve, bevelled from the outer to the inner edge. Deltidial plates narrow triangular, not meeting in the middle line. Teeth small, projecting inwards and backwards. Dorsal valve convex longitudinally and transversely, slightly prominent centrally, and sloping at the sides; lateral edges convex, anterior edge slightly concave. Hinge line narrow and straight. Tooth sockets well developed, excurved, and pointed ventrally. Crura rather short and stout. Loop annular, completed by a ventrally convex ventral crural

band ; the side pieces are shallow and project obliquely forward : the dorsal band is longitudinally wide, concave dorsally, projecting well in advance of the ventral band, and with a deep, nearly square, sinus in its posterior edge (whence the specific name).

Sculpture. — Longitudinal ribs, about 12 at first, flatly triangular, crenulating the edge of the foramen, and increasing by trichotomous division. Growth lines scarcely visible; some irregularly-distant concentric shallow grooves.

Dim. — Length, 16'25 mm.; width, 11*5 mm.; depth, 7 mm. The largest is 14 mm. wide. Another is 17'5 mm. by 12'25 mm.

Locality. — Type locality, at 130 fathoms, off Cape Jaffa, 37 examples, all dead (7 probably nearly or quite full grown, 5 small, and 25 very small) : also, at 300 fathoms, 4 mature, 13 small, and 76 very small.

Diagnosis. — T. cancellata, Koch, is closely allied,, but is flatter, has more numerous, rounder, rougher riblets arising by irregular intercalation ; its loop is wider, and has narrower bands, and the dorsal bridge has posteriorly a blunt central projection instead of a sinus.

Magellania flavescens, Lamarck.

Terebratula flavescens, Lamarck, Anim. S. Vert., vol. iv., 1819, p. 246, also vol. vii., 1836, p. 330. Type locality— The seas of India to Java. Conch. -Cab., Band vii., Abt. i., p. 45, sp. 27, pi. 2d, fig. 4.

Terebratula australis, Quoy and Gaimard, Voy. de l'Astr., 1834, Moll., vol. v., p. 551, pi. lxxxv., figs 1-5, Port Western, Vict, j Sowerby, Thes. Conch., 1847, p. 349, sp. 13, pi. lxix., figs. 25-33.

Terebratula dentata, Lamarck, Anim. S. Vert., 1836, vol. vii., p. 331. Type locality — The southern seas (?), Peron.

Terebratula incurva, Quoy and Gaimard, loc. cit., p. 554, pi. lxxxix., figs. 11 and 12.

Waldheimia flavescens, Lamarck, Reeve, Conch. Icon., 1860, pi.

I and 2, figs, la, b; Tenison- Woods, Proc. Roy. Soc, Tasm., 1878 (1877), p. 57, north coast of Tasmania; Davidson, "Challenger" Rep. Zool., vol. i., 1880, p. 41, pi. iii., figs. 10-12; also, Proc. Linn. Soc, Lond., vol. iv., 1886, p. 41, pi. vii., figs. 6-19; Hedley, Memoirs Austr. Mus., vol. iv., 1902, p. 289,

II to 15 fathoms, off the Crookhaven River.

Magellania flavescens, Lamarck, Tate and May, Proc. Linn. Soc., New South Wales, vol. xxvi., 1901, p. 441.

Found all along the South Australian coast, as far as Point Sinclair. Dredged alive at all depths from 6 to 30 fathoms in numbers ; at 40 fathoms, off Beachport, 10, from very minute to 1 quarter-grown; and at 100 fathoms, 19 minute, alive.

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Magasella cumingi, Davidson.

Terebratellaf?) cumingii, Davidson, Ann. and Mag., Nat. Hist. 1852, 2nd ser., vol. ix., p. 368, and Proc. Zool. Soc, Lond., 1852, p. 78, pi. xiv., figs. 10-16.

TerebratuJa (BouchardiaJ cumingii, Reeve, Conch. Icon., 1861, pi. viii., fig. 30.

Magasella cumingii, Davidson, 'Challenger" Rep. Zool., vol. i., 1880, p. 48.

M. cumingi, Davidson, Proc. Zool. Soc, Lond., 1886, p. 97, sp. 54, pi. xvii., figs. 23-32.

Magas cumingi, Davidson, Angas, Proc. Zool. Soc., Lond., 1867, p. 935, "deep water outside Port Jackson Heads."

Terebratula (BouchardiaJ fibula, Reeve, Conch. Icon., 1861, pi. viii., fig. 30.

Dredged in both gulfs and both straits at 12 fathoms, 75 alive; at 13 fathoms, 6 alive; at 15 fathoms, 51 alive; at 17 fathoms, 83 alive; at 20 fathoms, very many; at 22 fathoms,, great numbers; at 27 fathoms, 2 alive; at 30 fathoms, several dead ; at 35 fathoms, off St. Francis Island, 2 alive; at 40 fathoms, off Beachport, 15 small, dead; and at 49 fathoms, 24 small, dead ; at 55 fathoms, off Cape Borda, 7 small, dead ; and at 62 fathoms, 27 small, dead ; at 90 fathoms, Cape Jaffa, 10 minute; at 110 fathoms, Beach-port, 20 perfect (several alive up to full-grown); at 130 fathoms. Cape Jaffa, 26 minute and up to adult; at 150 fathoms, Beachport, 19 perfect, small, and 15 valves; and at 200 fathoms, 7 dead, very poor.

Magasella exarata, n. sp , Verco. PI. xxviii., figs. 6 to 8.

SheJl small, solid, oval, compressed dorso - ventrally, white. Dorsal valve nearly flat, with a shallow median fur-row widening anteriorly; slightly convex longitudinally and transversely ; lateral margin sinuous, convexo-concave from behind, and convex in front to correspond with the median sinus. Ventral valve twice as deep as the dorsal, uni-

formly convex longitudinally. Beak projecting considerably beyond the hinge line, solid, slightly curved dorsally. Foramen triangular, completed in front by the dorsal valve, rounded behind, and not extending to the end of the beak; bounded at the sides by a solid, stout, low lamina. Sculpture, numerous axial diverging riblets, increasing by intercalation, with concentric riblets, somewhat irregular in size and distance. Border internally plicately toothed. The hinge teeth in the ventral valve are very low and small and tubercle -like. In the dorsal valve the laminae on the inside of the tooth sockets are prominent and solid. From the anterior end of their bases tw T o short stout processes project forwards ventrally, and converge without uniting. Two

**[Begin Page: Page 98]**



low ridges also extend forwards on the wall of the valve from the bases of the laminae, and unite just in front of its centre, and continue as an obsolete ridge to the front margin.

Dim.— Length, 775 mm. ; width, 5*5 mm. ; depth, 2 mm.

Diagnosis. — M. cumingi, Davidson, is smooth, without external sculpture, and has a fine foramen at the end of the beak. .,

Locality. — Type, at 150 fathoms, off Beachport, with

1 other good and 1 of a narrower form ; also, at 40 fathoms,

2 good, and at 110 fathoms, 1 good and 1 valve; at < 49 fathoms, off Gape Jaffa", 1 small.

Mag'asella vercoi, Blochmami, antea.

I may add to the locality given by the author.

Dredged in Backstairs Passage, at 16 to 18 fathoms, 15 alive, many dead; at 19 fathoms, a great many alive and dead, probably 200 ; at 20' fathoms and at 22 fathoms, very many ; at 40 fathoms, off Beachport, 2 good and 3 moderate ; at 62 fathoms, off Cape Borda, 2 poor; at 110 fathoms, off Beachport, 3 good and 9 moderate; at 130 fathoms, off Cape Jaffa, 2 poor, 21 poor and rolled ; at 150 fathoms, off Beach-port, 2 good, quite white; and at 200 fathoms, 2 valves, poor.

Its habitat seems to be just about Backstairs Passage from 15 to 22 fathoms, beyond which it is rare and dead.

This is the shell which Tate recorded as Megerlia wille-moesi, Davidson, from 22 fathoms, in Encounter Bay (R. H. Pulleine), in Trans. Roy. Soc. of S. Austr., vol. ix., 1886, p. 110.

Magasella jaffaensis, Blochmami, antea.

I may add to the locality given by the author.

Dredged, all dead, off Cape Jaffa, at 90 fathoms, 35
large and small, and 24 very small; at 130 fathoms, 17
moderate size, 2 small ; at 300 fathoms, 16 good, very small,
and 6 very poor; at 110 fathoms, off Beachport, 4 good;
at 150 fathoms, 8 moderate ; at 200 fathoms, 8 moderate.
1 good, and 6 valves.

Kraussina (Megerlina) lamarckiana, Davidson.

Kraussia lamarckiana, Davidson, Proc. Roy. Soc, Lond.,
1852, p. 80, pi. xiv., figs. 22 and 23. Type locality— Sydney .
H. and A. Adams, The Genera of Recent Mollusca, vol. ii., p.
579, 1858.

Terebratula (Kraussia) lamarckiana , Davidson; Reeve,
Conch. Icon., pi. ix., fig. 34, 1861,

**[Begin Page: Page 99]**



Kraussinu lamarckiana, Davidson; Chenu, Man. de
Conch., 1862, vol. ii., p. 206', fig. 1057; Tenison- Woods, Proc. Roy.

Soc, Tasm., 1878 (1877), p. 57, Long Bay, Tasmania; Davidson, "Challenger" Rep. Zool., vol. i., 1880, p. 53, pi. iv., fig. 9.

Dredged alive off Cape Willoughby, Kangaroo Island, at 20 fathoms, 10 alive; at 17 fathoms, off Point Marsden, Kangaroo Island, 1 alive ; at 62 fathoms, off Cape Borda, 1 dead; at 110 fathoms, off Beachport, 1 dead. Taken on the beach at Guichen, Holdfast, and Fowler Bays and on St. Francis Island.

Kraussina atkinsoni, Tenison- Woods.

Krausskt atkinsoni, Tenison- Woods, Proc. Roy. Soc, Tasm., 1878 (1877), p. 57. Type locality— Long Bay.

. Kraussina, . etc. ; Davidson, Proc. Linn. Soc, Lond., 1887 (1886), p. .127, pi. xxi., figs. 5 and 6 ; Twelvetrees and Petterd, Proc. Roy. Soc, Tasm., 1900, p. 90, fig. 4; Tate and May, Proc. Linn. Soc. New South Wales, 1901, vol. xxvi., p. 442. ;

Taken on the beach at Robe, and at Venus Bay, rare.

Cistella australis, Blochmann, ardea.-
Dredged in 20 fathoms, off Cape Willoughby, Kangaroo Island, 7 alive.

EXPLANATION OF PLATES.

Plate XXVII.

1. Magasella verco'i, Blochmann, side view.

2. ,, ,, ,, dorsal view.

3. ,, ,, ,, interior.

4. ,, ,, ,, side view.

5. ,, ,, ,, inclined side view of in-

terior.

. 6. Magasella jaffaensis, Blochmann, dorsal view.

7. ,, ,, ,, side view.

8. ,, ,, ,, dorsal view.

9. ,, ,, ,, interior.

10. Cistella australis, Blochmann, interior of ventral valve.

11. ,, ,, ,, interior of dorsal valve.

12. ,, ,, ,, dorsal view.

13. . ,, cuneata, Risso, interior, for comparison.

Plate XXVIII.

1. Terebratulina cavata, Verco, ventral valve, interior.

2. ,, ,, ,, dorsal valve, exterior.

3. ,, ,, ,, ventral valve, side view.

4. ,, ,, ,, dorsal valve, side view.

5. ,, ,, ,, brachial apparatus.

6. Magasella exarata, Verco, side view.

7. ,, ,, „ dorsal view.

8. ,, ,, ,, brachial apparatus.

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